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APPLICATION NUMBER: *60/403,698*
FILING DATE: *August 15, 2002*
RELATED PCT APPLICATION NUMBER: *PCT/US03/25837*

By Authority of the
COMMISSIONER OF PATENTS AND TRADEMARKS

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Certifying Officer

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PROVISIONAL APPLICATION FOR PATENT COVER SHEET

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53(c).

INVENTOR(S)		
Given Name (first and middle [if any])	Family Name or Surname	Residence (City and either State or Foreign Country)
David Eugene	Wolf Diaconu	Brooklyn, New York Bensalem, Pennsylvania

☐ *Additional Inventors are being named on the ___ separately numbered sheets attached hereto*

TITLE OF THE INVENTION (280 characters max)

Air Tight Down Light with Improved Efficiencies

Direct all correspondence to: **CORRESPONDENCE ADDRESS**

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ENCLOSED APPLICATION PARTS *(check all that apply)*

☒ Specification *Number of Pages* 6 ☐ CD(s), Number

☒ Drawing(s) *Number of Sheets* 10 ☐ Other (specify)

☐ Application Data Sheet. See 37 CFR 1.76

METHOD OF PAYMENT OF FILING FEES FOR THIS PROVISIONAL APPLICATION FOR PATENT *(check one)*

☒ Applicant claims small entity status. See 37 CFR 1.27.

☐ A check or money order is enclosed to cover the filing fees

☒ The Commissioner is hereby authorized to charge filing fees or credit any overpayment to Deposit Account Number: 50-1290

☐ Payment by credit card. Form PTO-2038 is attached.

FILING FEE AMOUNT ($): 80

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

☒ No.

☐ Yes, the name of the U.S. Government agency and the Government contract number are: _____

Respectfully submitted,

SIGNATURE _____ Date 8 / 15 / 02

TYPED or PRINTED NAME Harris A. Wolin REGISTRATION NO. *(if appropriate)* 39,432

TELEPHONE 212-940-8800 Docket Number: WOLF 19.787P

USE ONLY FOR FILING A PROVISIONAL APPLICATION FOR PATENT

This collection of information is required by 37 CFR 1.51. The information is used by the public to file (and by the PTO to process) a provisional application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 8 hours to complete, including gathering, preparing, and submitting the complete provisional application to the PTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, Washington, D.C. 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Box Provisional Application, Assistant Commissioner for Patents, Washington, D.C. 20231.

AIR TIGHT DOWN LIGHT WITH IMPROVED EFFICIENCIES

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of the light fixture of the present invention. FIG. 2 is an exploded view of the light fixture of the present invention. FIG. 3 is an exploded view of the reflector assembly used with the fixture. FIG. 4 is an exploded view of the lighting assembly of the fixture of the invention. FIG. 5 is an exploded view of the junction box showing the removable knockout panels of the present invention. FIG. 6 is a cross-sectional view of the light fixture of the invention. FIG. 7 is a side elevation of the light fixture of the invention. FIG. 8 is an elevation view of the light fixture installed in a ceiling. FIG. 9 illustrates the placement of a lamp into the socket of the fixture of the invention. FIG. 10 illustrates the movement of the socket hinge during installation of the lamp and fixture into the ceiling.

DETAILED DESCRIPTION

The light fixture of the present invention generally comprises a can, a reflector, a ceiling plate that serves as a decorative trim member, a lighting unit and a junction box. The light fixture is preferably air tight, so it can be installed in a variety of locations, and it is assembled using slidable and/or snap-fit connections. The fixture is particularly suited for both new construction and as a retrofit for existing installations. Each aspect of the fixture of the invention is illustrated in the drawings.

The junction box (see FIG. 5) houses the lighting assembly (see FIGS. 4 and 5) and is attached to the ballast at the rear thereof and to the can at the front thereof. The

ballast attaches to the junction box via the slidable engagement of pins (see FIG. 2) on the ballast with slots (see FIG. 5) at the rear of the junction box. The junction box is provided with removable panels to accommodate wiring and the like, while each panel is also provided with removable cutouts for wiring access.

A lighting socket and socket holder (FIGS. 2, 4) are slidably engaged with the interior side walls of the junction box. A socket hinge and junction box pin (FIG. 9) are attached to the socket to allow for the pivoting of the socket within the junction box. Specifically, the socket holder is initially angled downward (FIGS. 9, 10) for easy insertion of a lamp element therein, particularly when the socket is installed in the ceiling. Subsequent to insertion of the lamp element, attachment of the ceiling plate to the can assembly causes the ceiling plate to push against the junction box pin (FIGS. 9, 10), which causes the socket holder to rotate about the socket hinge and thereby reorient the socket and lamp combination into a horizontal position (FIG. 6). Thus, as the reflector is shaped in a fairly close relation to the lamp unit (FIG. 6), which results in the lighting unit producing an overall efficiency of greater than approximately 84%, it is beneficial that the socket holder is capable of pivoting away from the reflector for easy manipulation of the lamp unit relative to the reflector and to the socket.

The can has a first closed end positionable in a ceiling and a second free end terminating in a flange. The flange is preferably circumferentially dimensioned so that it will not pass through a ceiling orifice (see FIG. 8) through which the light fixture of the present invention is installed. At least one, and preferably a plurality of ceiling clips or

retaining members for retaining the can in a ceiling location are disposed on the can and preferably around the flange as shown. The can is inserted from its first end through a ceiling orifice from below the ceiling until the rear surface of the flange abuts the exposed surface of the ceiling.

Prior to or after insertion of the can through a ceiling orifice, the reflector is snapped into the can. The reflector is uniquely designed to maximize the light output and efficiency. Current tests reveal a lighting efficiency of approximately 84.4%.

As shown in FIGS. 2 and 3, the ceiling plate is provided with at least one, and more preferably a plurality of tabs extending inwardly from a peripheral rim. Due to the thinness of the can flange, the clearance between the tabs and rear surface of the ceiling plate is relatively small. The peripheral edge of the can flange has a series of arcuate sections and planar sections, with the front surface of the flange being entirely planar. The rear surface of the flange is formed with ramped portions carved out of the rear surface, while the thickness of the can flange varies from approximately 2 mm to approximately 1 mm along the ramped portions.

Initially, the ceiling plate is brought into overlapping alignment with the can flange so that the ceiling plate tabs are situated adjacent the planar sections of the can flange and not securely fastened to the flange. Then, the ceiling plate is rotated clockwise, so that the tabs slide onto the ramped portions along the rear surface of the can flange until the tabs encounter stops formed by the ends of the ramped portions, and thus becomes securely fitted to the can flange. Removal of the ceiling plate from the can

flange is accomplished by a counter-clockwise rotation of the ceiling plate with respect to the can flange.

FIGS. 2, 3, 7 and 8 illustrate the ceiling clips used to fasten the can to the ceiling. The primary component of a ceiling clip is a movable flag-like member (flag) threaded on a threaded fastener, which threaded fastener has been passed through the can flange. The flag is positioned between a short post and a tall post. Initially, the flag is positioned directly over the shorter post as shown in FIGS. 3 and 7 and lies adjacent the can. Initially, the flag is also positioned such that it does not extend beyond the peripheral edge of the can flange. There is a tight engagement between the flag and fastener so that the flag turns with the fastener when the flag is not abutting one of the posts or the can. Counter-clockwise (fastening) rotation of the threaded fastener via the flange causes the flag to rotate counter-clockwise with the fastener until the flag abuts the larger post and extends beyond the periphery of the can flange. Continued rotation of the threaded fastener while abutting the larger post causes the flag to thread or move downwardly along the fastener until the flag engages the ceiling. Clockwise rotation of the fastener causes the flag to rotate with the fastener clockwise until such flag abuts the shorter post. Continued clockwise rotation of the threaded fastener causes the post-abutting flag to thread or move upwardly until the flag clears the shorter post, at which point the flag continues a clockwise rotation with the fastener until the flag clears the periphery of the can flange and lies adjacent the can as shown in FIGS. 3, 7 and 8.

The light fixture is initially assembled to the extent shown in FIG. 1, but without attachment of the lamp unit or the ceiling plate. Such partially assembled light fixture is then inserted through an orifice in the ceiling until the can flange, and more particularly the rear surface thereof, abuts the exposed surface of the ceiling. Can flange is dimensioned to prevent complete or over insertion of the light fixture through the ceiling orifice. Once flange has been positioned against the exposed surface of the ceiling, threaded fasteners are tightened until the flags abut posts, thereby extending beyond the periphery of the ceiling orifice, and continued tightening of the fasteners causes the flags to move downward until such flags clamp the unexposed surface of the ceiling as shown in FIG. 8, thereby securing the can and attached lighting unit to the ceiling. Once the can and attached lighting unit have been secured to the ceiling, a lamp unit is inserted into the downwardly-angled socket (FIG. 9), after which the ceiling plate is rotatably and securely engaged with the can flange through the movement of tabs along ramped portions as previously described. Attachment of the ceiling plate to the can flange causes the ceiling plate to impact against the junction box pin (FIG. 9), which causes the socket and lamp unit to rotate into a position shown in FIG. 6. Later removal of the ceiling plate from the secured light fixture is as easy as rotating the ceiling plate in the opposite direction so that tabs become aligned with the planar portions of the can flange. Later withdrawal of the light fixture from the ceiling through a ceiling orifice is also as easy as rotating the threaded fasteners until each flag lies adjacent the can and no longer extends beyond the periphery of the ceiling orifice.

It should be appreciated that the light fixture of the present invention is secured directly to the ceiling via retaining members, and does not require attachment to a support beam or the like, which support beam may or may not be present in a desired lighting location. It should also be appreciated that the thinness of the flange and the relative thinness of the ceiling plate tabs and peripheral edge of the ceiling plate allows the ceiling plate to securely engage the flange and lie flush against the exposed ceiling surface after engagement.

It should also be appreciated that most of the components that form the lighting fixture are snap engageable or slidably engageable. In fact, it is only during the rotation of the retaining members in the embodiment described above that an external tool is required.

The ease with which the entire lighting fixture snaps together also allows for variations in the aesthetic (viewable) components, such as the ceiling plate and any other components visible from below the ceiling.

While the present invention has been described at some length, it is not intended that it should be limited to any such particulars or embodiments or any particular embodiment shown herein. Furthermore, the foregoing describes the invention in terms of embodiments foreseen by the inventor for which an enabling description was available, notwithstanding that insubstantial modifications of the invention, not presently foreseen, may nonetheless represent equivalents thereto.

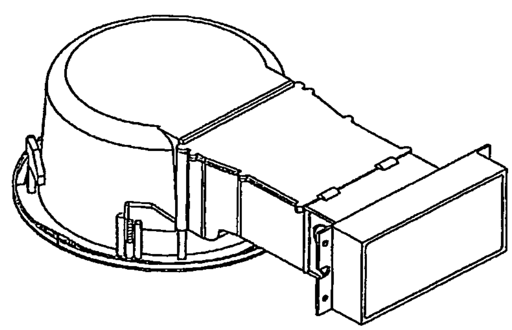

FIG. 1

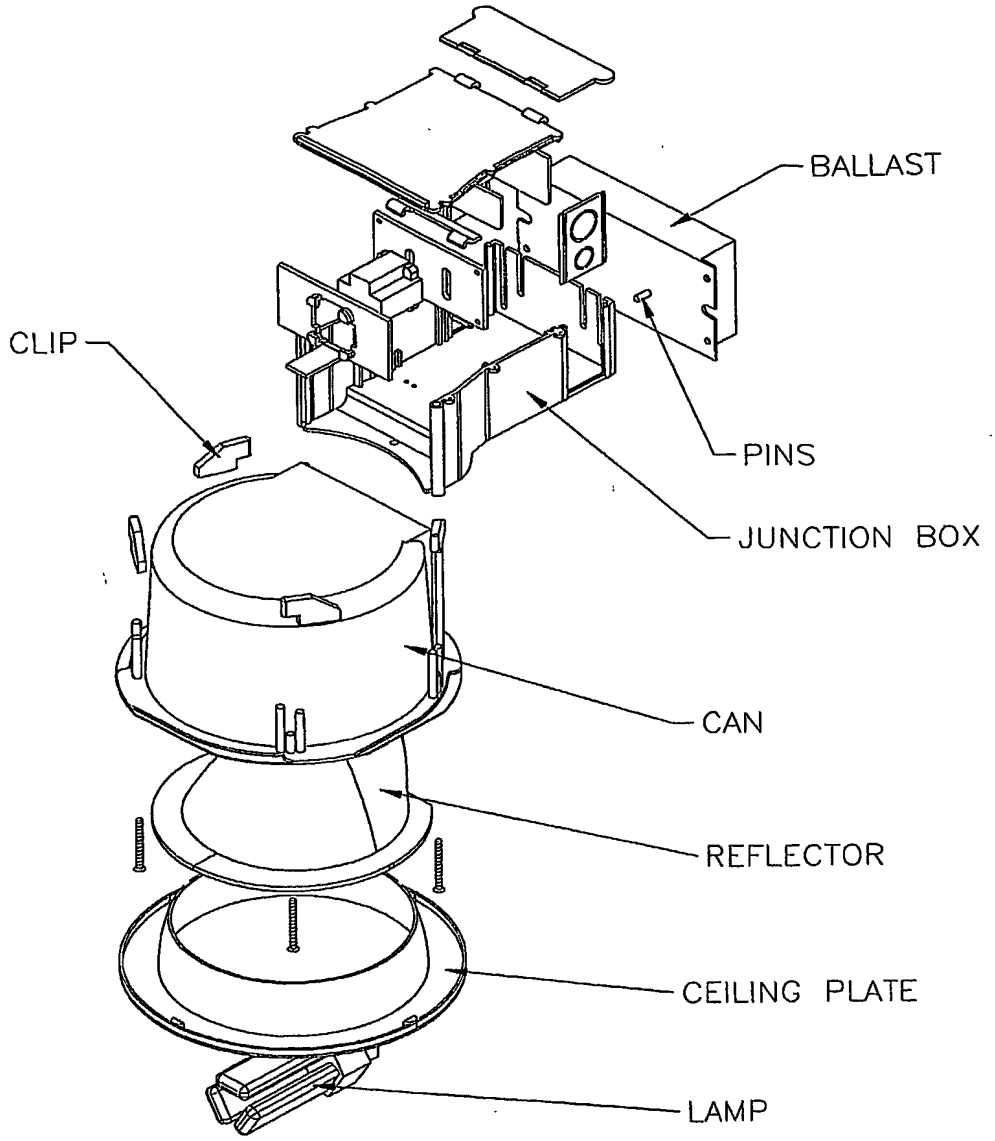
BALLAST
CLIP
PINS
JUNCTION BOX
CAN
REFLECTOR
CEILING PLATE
LAMP

FIG. 2

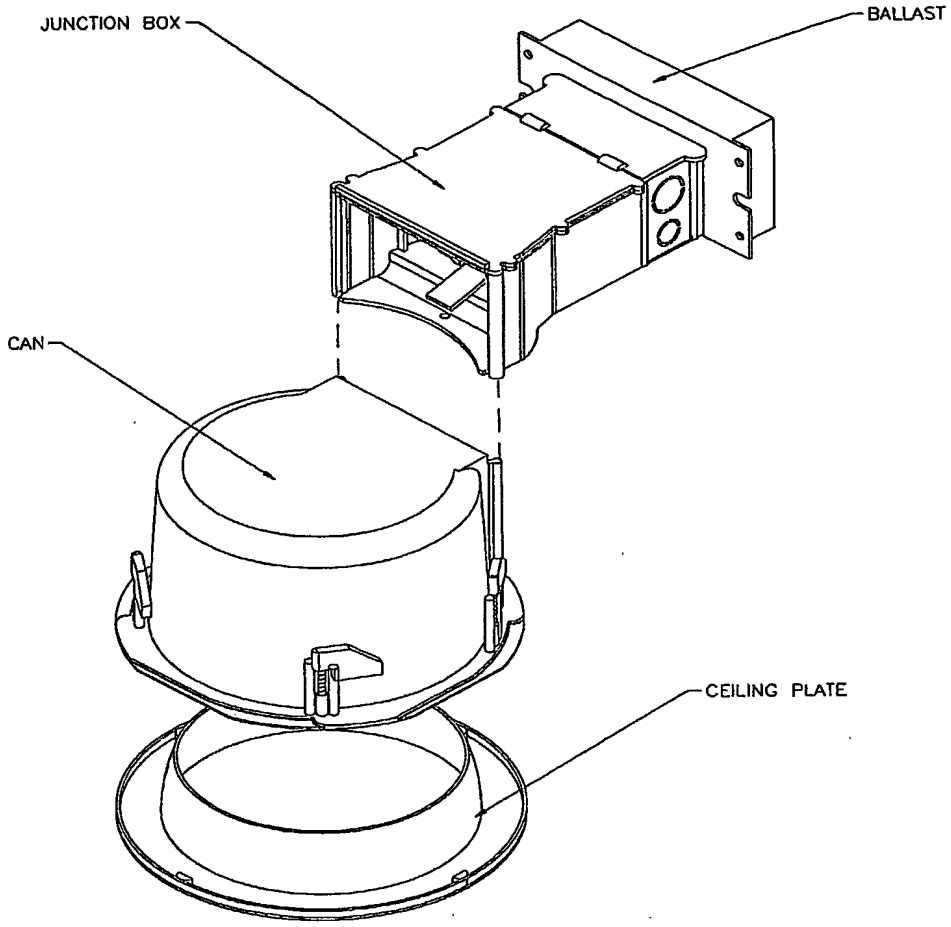

FIG. 3

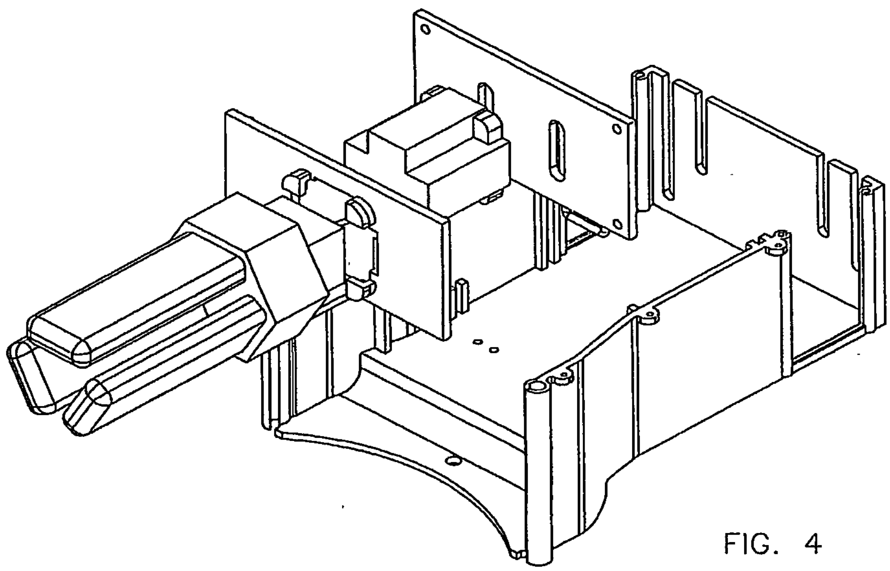

FIG. 4

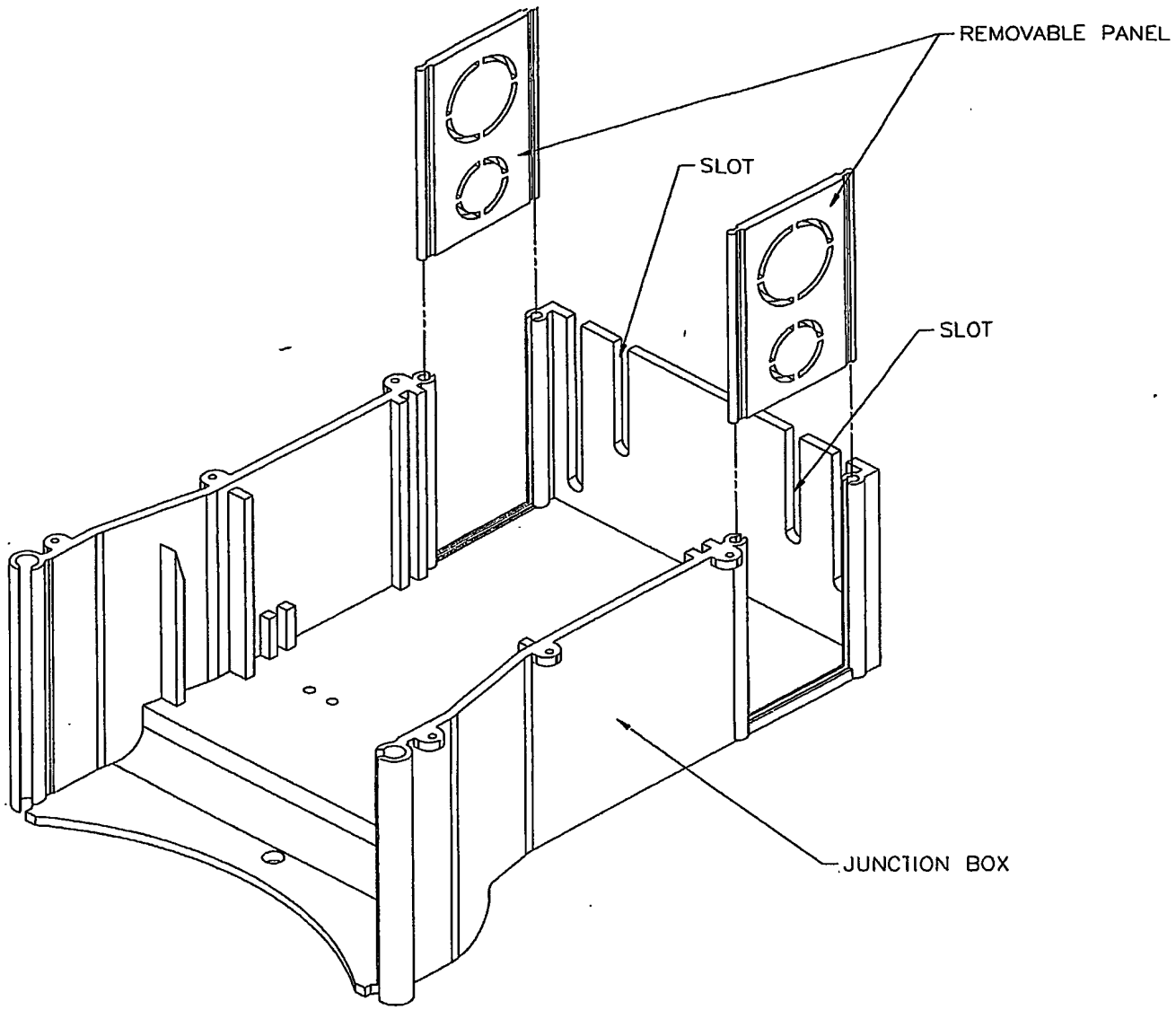

FIG. 5

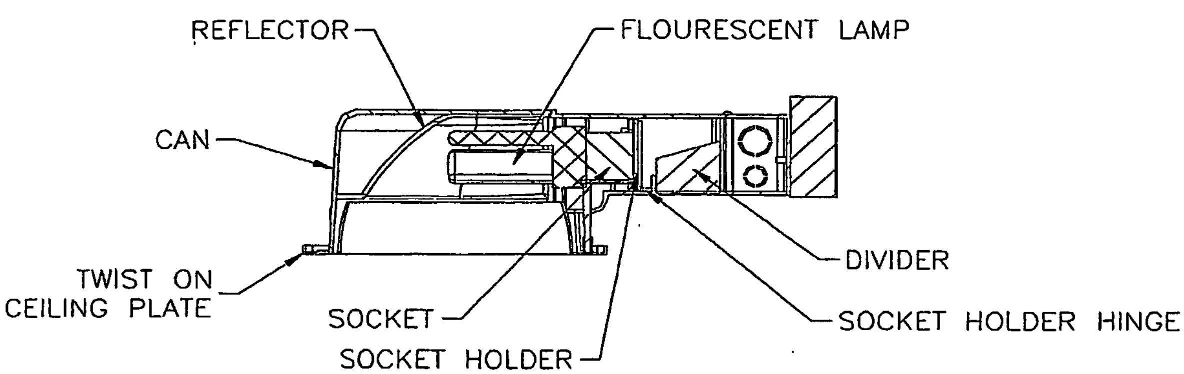
REFLECTOR
FLOURESCENT LAMP
CAN
TWIST ON
CEILING PLATE
SOCKET
SOCKET HOLDER
DIVIDER
SOCKET HOLDER HINGE

FIG. 6

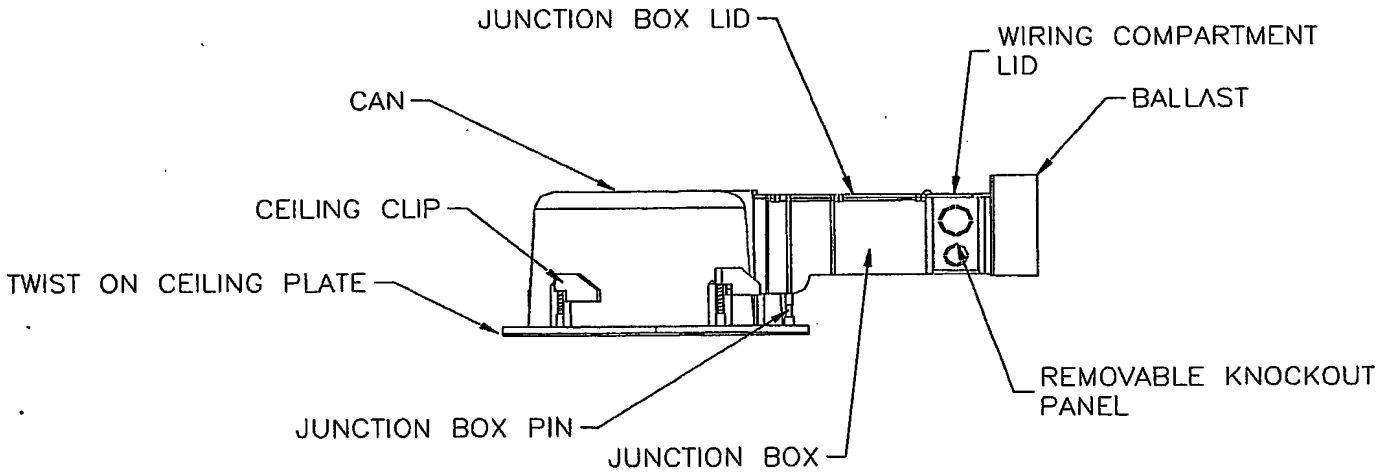
JUNCTION BOX LID
WIRING COMPARTMENT LID
CAN
BALLAST
CEILING CLIP
TWIST ON CEILING PLATE
REMOVABLE KNOCKOUT PANEL
JUNCTION BOX PIN
JUNCTION BOX

FIG. 7

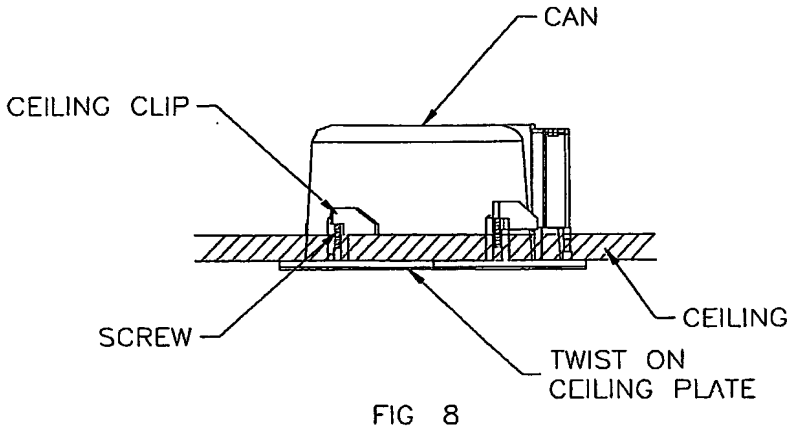

FIG 8

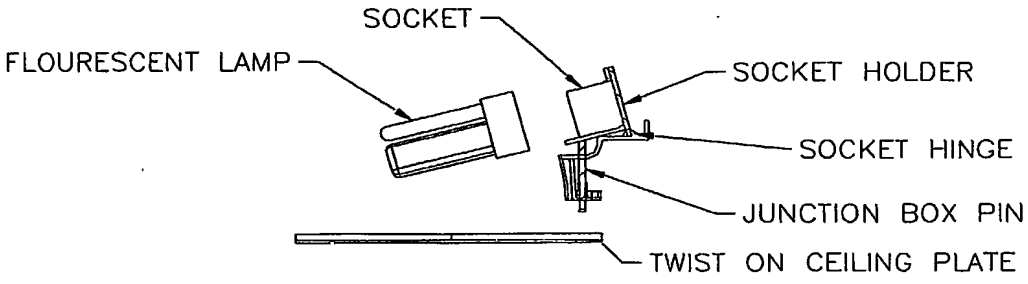
SOCKET
FLOURESCENT LAMP
SOCKET HOLDER
SOCKET HINGE
JUNCTION BOX PIN
TWIST ON CEILING PLATE

FIG 9

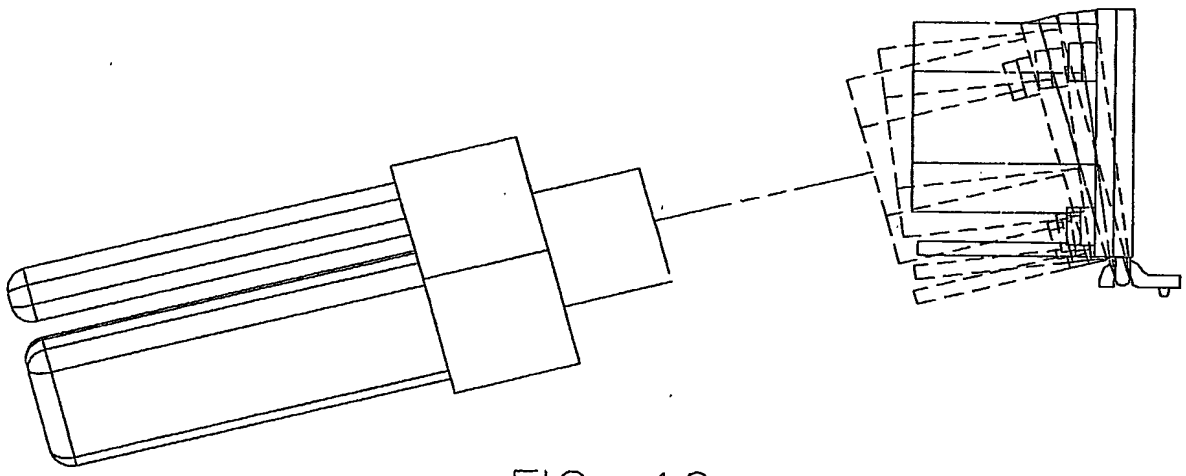

FIG. 10